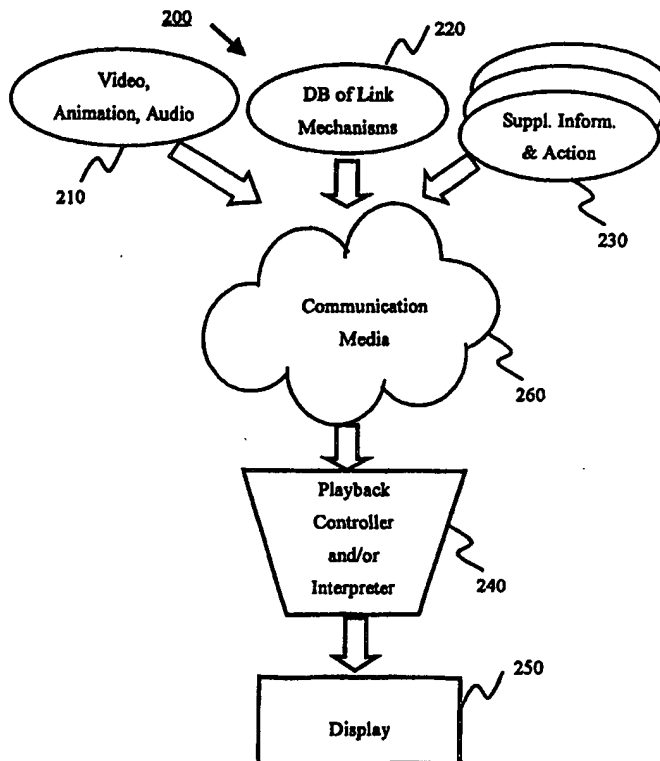




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(54) Title: METHOD AND APPARATUS FOR CONTENT-LINKING SUPPLEMENTAL INFORMATION WITH TIME-SEQUENCE DATA (57) Abstract <p>A method, apparatus and computer program product are disclosed for linking supplemental information and/or actions (120-124) on-the-fly with animation, audio and/or video data (110) for presentation, dependent upon the content of the animation, audio and/or video data (110). The supplemental information and/or actions (120-124) are preferably advertisements and means of electronic commerce linked on the fly with the animation, audio and/or video data (110). In this manner, advertisements (162-168) can be flexibly and controllably delivered in combination with the animation, audio and/or video data (160). The latter may be delivered by broadcasting or by streaming over an electronic network. The animation, audio and/or video data (210), advertisements (230) and an advertisement control database (220) containing linking mechanisms or structures are provided to a playback controller and/or interpreter (240), which can be implemented using a personal computer or a set topbox, prior to being displayed on a display or other presentation mechanism (250). The user can interact with the supplemental information and/or action (250).</p>		



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METHOD AND APPARATUS FOR CONTENT-LINKING SUPPLEMENTAL INFORMATION WITH TIME-SEQUENCE DATA

FIELD OF THE INVENTION

- 5 The present invention is directed to the field of delivering animation, audio and video data via broadcasting or network mechanisms, and in particular to systems for providing value-added content to animation, audio and video programming.

BACKGROUND

- 10 With the rapid advent of technologies such as digital multimedia, broadband networking, video on demand, and the Internet, large volumes of audio, animation and video data or programming are readily available to the public. This programming can be delivered to an audience by a multitude of ways including broadcasting, on-demand type systems, etc. However, there are not adequate mechanisms to distinguish
15 programming distributed in this fashion from traditional forms such as broadcast television or screened movies.

- There are several known systems which offer video-on-demand and pay per-view services. These systems afford an opportunity for serving the audience with additional
20 information about the programming. Existing mechanisms require the user to actively request any additional information. However, these mechanisms have a number of drawbacks. A first disadvantage is that a user must have adequate knowledge of their own to request any additional information. The information is not associated with the content of the programming. Still further, there is no guarantee that the user will
25 request and view the additional information that is available. This is a major impediment, particularly in advertising.

- In existing methods for normal TV broadcast situations to systems such as Synchronised Multimedia Integration Language (SMIL), Microsoft Netshow, MPEG-
30 4, etc., the programming is required to be created, or packaged, afresh along with the associated information into a single entity. This has a number of disadvantages

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including a lack of flexibility and programmable control. Further, it cannot be done on the fly. If the associated information changes, the entire package must be redone. That is, additional information cannot be changed with online digital content or broadcast material in current formats, unless there is a repackaging and/or format conversions.

Thus, a significant disadvantage of such conventional systems is that they do not permit a service provider, who offers audio, animation and video data services, to associate additional information with the programming and provide the two without interfering with the programming production process. Existing systems also fail to provide additional information with the digital media content without changing the way in which the content is produced, stored, and/or distributed.

SUMMARY

The following aspects of the invention are directed to ameliorating or overcoming one or more disadvantages of conventional systems including those described above.

In accordance with a first aspect of the invention, a method is provided for presenting supplemental information and/or action with time-sequence data. The time-sequence data can be animation, audio, and/or video data. The method includes the steps of: providing time-sequence data; separately providing supplemental information, action, or both, from the time-sequence data; and linking the supplemental information, action, or both, with the time-sequence data during playback of the time-sequence data.

Preferably, the supplemental information and/or action is linked with the time-sequence data by a start time and a stop time, or a start time and a duration period.

Alternatively, the supplemental information and/or action can be linked with the time-sequence data by annotation information associated with the time-sequence data. Yet further, the supplemental information and/or action can be linked with the time-sequence data using on-the-fly content analysis of the time-sequence data during playback of the latter.

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Preferably, the supplemental information and/or action is content-linked with the time sequence data. The time-sequence data can be provided by broadcast or via a network. The supplemental information and/or action is preferably provided remotely
5 via a network. It can include a displayed prompt with which a user can interact by user input and a link to a remote location. The link is more preferably a universal resource locator (URL). The following mechanisms can also be provided remotely via a network.

10 Preferably, the time-sequence data and the supplemental information and/or action are linked by a link mechanism. Two or more of the link mechanism, the time-sequence data, and the supplemental information and/or action are initially co-located at their source. Alternatively, two or more of the link means, the time-sequence data, and the supplemental information and/or action are initially remotely located at one or more
15 source locations.

In accordance with another aspect of the invention, an apparatus is provided for presenting supplemental information and/or action with time-sequence data. The apparatus includes: a device for providing time-sequence data; a device for separately
20 providing supplemental information and/or action from the time-sequence data; and a device for linking the supplemental information and/or action with the time-sequence data during playback of the time-sequence data.

In accordance with yet another aspect of the invention, a computer program product is
25 provided having a computer readable medium having a computer program recorded therein for presenting supplemental information and/or action with time-sequence data. The computer program includes: a module for providing time-sequence data; a module for separately providing supplemental information and/or action from the time-sequence data; and a module for linking the supplemental information and/or action
30 with the time-sequence data during playback of the time-sequence data.

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BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the invention are described hereinafter with reference to the drawings, in which:

5 Fig. 1A is a timing diagram graphically depicting a linked combination of time-sequence data and supplemental information and/or action in accordance with embodiments of the invention;

Fig. 1B is a timing diagram illustrating the linked relationship of exemplary video,
10 animation and/or audio data and four advertisements in accordance with embodiments of the invention;

Fig. 2 is a block diagram illustrating the functional modules of an apparatus for presenting supplemental information, action, or both, with time-sequence data in
15 accordance with the a embodiment;

Fig. 3 is a block diagram illustrating a variation of the apparatus according to the first embodiment shown in Fig. 2;

20 Fig. 4 is a graphical depiction of an exemplary application of the embodiments where a video is displayed on a monitor with a corresponding advertising banner;

Fig. 5 is a high-level flow diagram of a method of delivering supplemental information and/or action with time-sequence data in accordance with the first embodiment of the
25 invention;

Fig. 6 is a flow diagram of a method of providing value-added content related to at least one of animation, audio and video data, in the process of presenting the animation, audio, and/or video data to a user in accordance with a second embodiment
30 of the invention;

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Fig. 7 is a flow diagram of a method of distributing advertisements with animation, audio and/or video data delivered for presentation by way of broadcast or streaming over a network in accordance with a third embodiment of the invention; and

- 5 Figs. 8A-8E are detailed flow diagrams of a method of presenting advertisements in association with video or movie in accordance with a fourth embodiment of the invention.

DETAILED DESCRIPTION

- 10 A method, apparatus and computer program product for linking supplementary information, actions, or both, to time-sequence (or "time-base) data is disclosed. The time-sequence data include animation, audio and/or video data. Fig. 1A is a timing diagram illustrating a linked combination 100 of time-sequence data 110 and supplemental information and/or action 120, 122, 124. Three portions 120, 122, 124
15 are linked for presentation with the time-sequence data. Essentially numerous forms of supplemental information and/or actions can be linked to the time-sequence data using the embodiments of the invention described herein. In addition to providing supplemental information, the embodiments can also provide "actions", which in broad terms denotes any additional functionality provided to the user. This can be
20 implemented as a computer program such as a Java applet that can be executed by a computer displaying time-sequence data. Exemplary actions include functionality for conducting surveys or for changing time-sequence data.

- Amongst other things, the embodiments enable video service providers such as cable
25 and broadcast television service providers to add controllably and on-the-fly added-value content to their video product by tightly linking advertisements to the subject-matter content of the video product. In this manner, the video with content-linked supplemental information and/or actions can be readily differentiated from normal broadcast video, for example. The same applies equally to audio and animation data.
30 The supplemental information and/or actions are provided via a network, preferably an electronic network such as the Internet or an Intranet.

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Fig 1B is a timing diagram illustrating the linked relationship 150 between a video, animation and/or audio program 160 and four advertisements 162, 164, 166, 168. Additional advertisement content may be available at a remote location on a network and be accessed by a link (e.g. URL) in the advertisement. As shown, the estimation 150 includes overlapping advertisements, namely first and third advertisements 162 and 166 on the one hand and the second advertisement 164 on the other. One or more of the video, animation and/or audio data, the supplemental information and/or action, and linking mechanisms or controls for linking the content data with the supplemental information and/or action can be distributed via a network. Further, they may be obtained from two or more different sources on the network. Thus, for example, a video content provider can provide the video programming via the Internet from a first source site, the supplemental information and/or action from another source site, and the linking control database from yet another site. Other combinations are possible. For example, the video programming may be available locally at a user's location while the other components are delivered via a network, or vice versa.

With reference to the example of video delivered by broadcast or a network, the embodiments of the invention enable advertisements to be tightly linked in a programmable and on-the-fly manner to the content of the video. An advertisement can be displayed as a graphical banner in combination with the video presented on a display monitor. Fig. 4 is a depiction of an exemplary application 400 of the embodiments where a video 420 is displayed with a corresponding advertising banner 430. In this example, the video data 420 is displayed in a panel of the graphical operating system 410 (e.g. Microsoft Windows 95 or 98). The exemplary portion of the video 420 is currently displaying a well-known water fountain at Sentosa Island in Singapore. In conjunction with the video 420 being presented, an advertisement 430 is presented within the same panel. It will be readily appreciated that the advertisement 430 need not be presented in the same window. The advertisement 430 is presented as a banner referring to "Destination Sentosa: Experience it all..." A user can click on the banner 430 while it is displayed, and further supplemental information and/or

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action can be obtained. For example, an advertisement 440 about Sentosa Island (shown in the background) can be retrieved via a URL of the banner 430 to download the advertisement 440 from a site on the Internet.

- 5 If the video is a film with actors and props, the advertisements can be directly linked to such video content. An advertiser can make direct reference in the advertisement to props in the video including articles of clothing, jewelry and accessories worn by particular actors in a scene. The advertiser can also make reference to items such as furniture, wallpaper and appliances. The foregoing applies to virtually anything visibly
10 and/or audibly perceptible in the video. Thus, the advertisement content-linked to the video can bring an item in the video to the viewer's attention and provide a way of making a purchase by the viewer using electronic commerce, for example.

- Again, the video can be streamed over an electronic network to a user's personal
15 computer with video display capabilities. By way of example, the video itself can be displayed in a window in a graphical operating system such as Microsoft Windows 95 (Trade Mark) running on a conventional personal computer, laptop computer, or work station. Also displayed in the window can be a banner or other graphical presentation containing information associating the banner with the content of the video.
- 20 Alternatively, the banner might be displayed in a separate window. By means of a textual reference, the banner can refer to a dress worn by an actress in the current video content as being sold by a particular advertiser. By appropriate interaction with the banner, the user can obtain further information about the dress or purchase it. The information obtained in this manner can be obtained remotely or in appropriate cases
25 locally. In one embodiment, the banner displays an HTML link to a remote site to which the user's personal computer is connectable by means of the Internet. From the advertiser's remote site, further information about the dress can be obtained including how to purchase it using electronic commerce or by telephone purchase.

- 30 In yet another illustration, a video track can be played on a display device such as a television receiver with touch-screen functionality. In conjunction with the television

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- receiver, a set topbox (associated with cable television services, for example) can be provided by which supplemental information and/or actions can be distributed. The functionality of such cable set topboxes are increasingly more sophisticated. An action can be displayed via the set topbox with the video on the television receiver, whereby
- 5 the relevant action can be chosen from a banner or the like displayed with the video. For example, the subject matter content of the displayed video can be a documentary about bears and include material on bears in Alaska. Where a segment about Alaskan bears is displayed, a banner displayed in association with the video can show a message indicating that a related program about Alaska is currently available for viewing. By
- 10 appropriate user interaction with the banner, such as touching an icon displayed in the banner, an action is carried out causing the displayed programming to change to the related program about Alaska without the user having to manually select the particular station.
- 15 In still another illustration, an audio track received by a tuner/receiver provided in a personal computer (e.g. Web radio) can be audibly output by the personal computer. In conjunction with the content of the audio segment, supplemental information and/or action can be displayed on the personal computer. The subject matter of the audio segment might involve discussion about some form of on-going audience survey, and
- 20 an appropriate prompt can be displayed on the personal computer dependent upon the audio content. By clicking on the prompt, the user can interactively participate in the survey over the Internet. Numerous other applications can be envisaged by those skilled in the art in view of the disclosure of the embodiments herein.
- 25 The embodiments of the invention are able to strongly link supplemental information and/or actions including advertising with the content of time-sequence data including animation, audio and video. Further, the embodiments of the invention enable flexible control of the flow of the supplemental information and/or action and its content. For example, the embodiments of the invention enable flexible control of the flow of
- 30 advertising in relation to an animation, audio and/or video sequence and the content of the advertising itself. Still further, the embodiments of the invention in particular

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applications enable close linkage of electronic commerce with the content of the time-sequence data.

The embodiments of the invention are able to differentiate time-sequence data from
5 conventional broadcast time-sequence data by providing a content-based linkage with
the supplemental information, action or both. Further, the embodiments provide a
non-interfering mechanism for providing the supplemental information, action or both
with respect to both the time-sequence data itself and the delivery mechanism used to
10 deliver the time-sequence data. That is, no modification of the time-sequence data or
its delivery mechanism is required. All existing time-sequence data can be used. For
example, a video delivered on demand over a network to an end-user does not require
any modification and can be sourced from a digital video disc (DVD) without change
or embedding additional information prior to transmission. Still further, the
15 embodiments support customised and focused content-linking of supplemental
information, action, or both to the time-sequence data. This is particularly
advantageous where the supplemental information, action or both relates to
advertising. In addition, the embodiments of the invention enable full, on-the-fly or
"realtime" control over the content, sequencing and timing of the supplemental
20 information, action, or both, delivered to the user in conjunction with the time-
sequence data. Thus, advertisers for example can have full and realtime control over
the advertisement content. Customised advertising can therefore be supported.

As an example, embodiments of the invention permit a video program to be delivered
via a network on demand or on a pre-scheduled basis to viewers. Sponsors of the
25 program or advertisers can buy slots, both in terms of time-length as well as the time
position in the video program. During the time slots, the sponsor or advertiser can
provide HTML, XML, or other format advertisements that appear on the viewer's
display device (e.g. a personal computer). The sponsor or advertiser can have full
control over their advertisement content, whereas the advertisement length and
30 position can be pre-negotiated and controlled by the delivery service provide (e.g.
cable service provider). The sponsor or advertiser provides a URL from where their

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advertisement content can be retrieved or downloaded. An advertisement delivered in this manner can provide a link to the sponsor's or advertiser's electronic commerce facility via a network or provide other means of conducting business. The latter might include providing a phone number to call for telephone transactions or the like.

5 Alternatively, a call centre can be contacted using video, audio or text communication.

Fig. 5 is a high-level flow diagram illustrating a method of delivering supplemental information, action, or both, with time-sequence data in accordance with a first embodiment of the invention. Processing commences in step 500. In step 502, time
10 sequence data is provided. Again, the time-sequence data can include one or more of animation, audio and video data or programming. The time-sequence data can be provided by broadcast or via a network. In step 504, supplemental information and/or action is provided separately from the time-sequence data. Examples of the supplemental information and/or action include a universal resource locator (URL) to a
15 remote site via a network, an interactive program, an icon, or an advertisement banner. In step 506, the supplemental information and/or action is linked with the time-sequence data during or immediately before playback of the time-sequence data. The supplemental information and/or action is preferably provided remotely via a network. The supplemental information and/or action can include a link to a remote location,
20 and in particular, a universal resource locator (URL). It can also include a displayed prompt with which user can interact by user input.

The supplemental information and/or action can be linked with the time-sequence data by means of a start time and a stop time, or a start time and a specified duration.

25 Alternatively, the supplemental information and/or action can be linked with the time-sequence data by means of annotation information associated with the time-sequence data. Still further, the supplemental information and/or action can be linked with the time-sequence data, which is dependent upon on-the-fly content analysis of the time-sequence data during playback of the latter. This may be done using any of a number
30 of known image/video/audio segmentation, recognition and analysis techniques well

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known to those skilled in the art. Preferably, the supplemental information and/or action is content-linked with the time sequence data.

In step 508, the time-sequence data and the supplemental information and/or action is
5 presented to an audience. In the case of video and animation information, presentation can be implemented using a display monitor of a personal computer, a television receiver, a video monitor or the like. In the case of audio information, the audio data (i.e. time sequence data) can be output by a personal computer (e.g. Web radio) or other conventional sound reproduction devices for broadcast and network streamed
10 audio. The supplemental information and/or action can be presented on a personal computer, a video monitor, or the like.

The time-sequence data and the supplemental information and/or action are linked by a link. At least two of the link, the time-sequence data, and the supplemental
15 information and/or action can be initially co-located at their source. Alternatively, two or more of the links, the time-sequence data, and the supplemental information and/or action can be initially remotely located at one or more remote source locations of the network. In step 510, processing terminates.

20 Preferably, the first embodiment of the invention depicted in Fig. 5 is implemented as software or a computer program for presenting supplemental information and/or action with time-sequence data. The software including a Java applet can be run on a computer such as a personal computer or workstation, or Java virtual machine, for example, well known to those skilled in the art. In particular, the computer program
25 can be recorded on a computer readable medium and used in combination with the computer as a computer program product. The steps of Fig. 5 can be implemented as modules of software containing operations or instructions to implement the functionality. Alternatively, the functionality of Fig. 5 can be implemented electronically (e.g. in an application specific integrated circuit ASIC). For example, it
30 can be embedded in a set top box for use with a video monitor or television receiver. Numerous other applications will be readily appreciated by those skilled in the art in

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view of the disclosure herein. The foregoing applies equally to further embodiments of the invention described hereinafter.

Fig. 2 is a block diagram illustrating the functional modules of an apparatus 200 for presenting supplemental information, action, or both, with time-sequence data in accordance with the first embodiment. Again, time-sequence data including video, animation and/or audio data 210 are provided by broadcast or via an electronic network. Alternatively, the data 210 may be provided locally. In addition, one or more linking mechanisms 220 is provided separately from the time-sequence data 210. Two or more linking mechanisms 220 are referred to in Fig. 2 as a database (DB) of linking mechanisms. The linking mechanism database can be prepared by video, animation, and/or audio content provider or the operator. Supplemental information and/or action (or value added content) 230 is also provided. This can be HTML/XML/other formats advertisements prepared and controlled by advertisers. Preferably, a linking mechanism 220 is a predefined data structure containing parameters of particular supplemental information and/or action 230 for presentation with a particular portion of the time-base data 210. Preferably, the database 220 is database of advertisement controls, and the supplemental information and/or action 230 is one or more advertisements.

One or more of the video, animation and/or audio data 210, the supplemental information and/or action 230 and linking mechanisms or controls 220 for linking the content data 210 with the supplemental information and/or action 230 can be distributed via one or more communication media 260. Further, they may be obtained from two or more different sources such as two or more sites on the Internet, or the video can be delivered via a cable television network. Other combinations are possible. While single-headed arrows are depicted in Fig. 2, it will be reading appreciated from the disclosure that communication between the components of Fig. 2 may be bi-directional.

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The time-sequence data 210, link mechanisms 220 and supplemental information and/or action 230 are provided to a playback controller and/or interpreter PCI 240. The PCI 240 merges the video, animation and/or video data 210 and the supplemental information and/or action 230 for presentation on an appropriate presentation device
5 ("display") 250. Preferably, the PCI240 has a cache for storing linking mechanisms 220. It also preferably has a cache for storing supplemental information and/or action 230. Again, the apparatus 200 can be implemented using a general-purpose computer or electronically.

- 10 For example, during a video program delivered to the apparatus 200 via a network either on demand or on pre-scheduled basis to viewers, sponsors of the program or advertisers can buy advertising slots. The advertising slots can be both in terms of time-length as well as the time-position in the video program. The advertisers can present their HTML/XML/other-formats advertisements on a viewer's display 250.
15 Using a URL, advertisement content can be downloaded. An advertisement can provide a link to the advertiser's e-commerce facility, or provide other means of conducting business. This gives advertisers full-control over their advertisement content, while the advertisement length and position is pre-negotiated and controlled by the video service provider.

20

- Consider a video program that airs at 8:00 PM and finishes at 8:30 PM. For this program, advertisers can buy slots that are variable length in time. These slots can be displayed at fixed points in time during the broadcast of the program. An advertiser for watches might display a watch advertisement while a lead actor in the video
25 program is wearing the watch, which the advertiser wants to sell to the viewers. At the same time, another advertiser for suits display a clothing advertisement, which might be longer or shorter than the watch advertisement. For on-demand type scenarios, the start time of the advertisements is with respect to the beginning of the program rather than in absolute time. The advertiser can get charged by the service
30 provider based on a number of factors, including the length of the advertisement slot,

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the placement of an advertisement during the program, and whether or not the slot is shared with someone.

An example entry in the linking mechanism database or advertisement control database is:

Start-time: 00:05:00

End-time: 00:06:00

Address: <http://www.watchesRus.com/advert/>

10 During the broadcast, the PCI 240 displays the video information 210 and starts interpreting the advertisement control 220. At a specified start time for a particular advertisement, the PCI 240 fetches the advertisement content from the specified address, which is defined in the advertisement control 220 along with the timing information. Alternatively, the embodiment can be practiced using annotation to link
15 the data 210 with the supplemental information and/or action 230. The advertisement content is displayed using the display or presentation device 250 (or the advertisement content can also be pre-fetched). The PCI 240 stops the display of the advertisement content when its duration has expired.

20 The format of the linking mechanism database or advertisement control database 220 has a format designed to be easy to produce, modify and maintain. It should also be efficient for transmission purposes and be extensible. Exemplary fields for the format are:

Period of advert display (from date – to date, which days)

25 Start time – End time (in minutes:seconds)

Size of advert on display (in inches)

Location of advert on display (llc, lrc, urc, ulc, center etc)

Address of advertisement content (URL)

30 Since the PCI 240 executes the database of linking mechanisms or advertisement control database 220, the PCI 240 is developed hand-in-hand with the format of a

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linking mechanism or advertisement control. In addition, so that more features can be added to the PCI 240, the PCI 240 should be well structured and extensible.

When a video, animation and/or audio program 210 starts, the address of the link
5 mechanism database or the advertisement control database 220 is transmitted with the initialization information.

Fig. 3 is a block diagram illustrating a variation 300 of the apparatus 200 shown in Fig. 2. For purposes of brevity, like features in Figs. 2 and 3 are identified with the same
10 reference numerals. Only differing elements or features are identified with numerals of the format 3XX. In particular, video, animation and audio 210 is provided to an on-the-fly content analyser 310 forming part of the apparatus 300. The content analyser 310 is connected to the PCI 240, and preferably forms part of the PCI 240. The content analyser 310 can be used to determine the linking of the supplemental
15 information and/or action with the video, animation and/or audio data 210, either entirely on its own or in combination with the linking mechanisms 220. A dashed-line arrow extends between the communication media 260 and the content analyser 310. This arrow indicates that optionally the video, animation and/or audio data 210 can be delivered directly to the content analyser 310 without passing through the PCI 240
20 first. This might be done where the content analyser operates completely independently or to reducing data processing via the PCI 240 to the content analyser 310.

Fig. 6 is a flow diagram of a method of providing value-added content related to at
25 least one of animation, audio and video data, in the process of presenting the animation, audio, and/or video data to a user in accordance with a second embodiment of the invention. Processing commences in step 600. In step 602, animation, audio, and/or video data or programming is delivered for presentation to a user. In step 604, the value-added content is provided separately from the animation, audio and/or video
30 data. The value-added content is preferably an advertisement and can include a universal resource locator (URL). However, as described above in terms of the

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supplemental information and/or action, the value-added content can include additional functionality, services and information. Alternatively, or in addition, the value-added content may include a set of instructions for performing operations on a local apparatus or a remote apparatus linked with the local apparatus by a network. The
5 local apparatus can be a personal computer or the like connected to the Internet, and the remote apparatus can be a site on the Internet.

In step 606, a linking mechanism or structure is provided, separate from the animation, audio, and/or video data, which can link the value-added content with the animation,
10 audio, and/or video data in a controllable and on-the-fly manner prior to presentation of the animation, audio, and/or video data and the value-added content. The linking mechanism can include a start time and a stop time of the value-added content in relation to the animation, audio, and/or video data, as well as an indicator of the location of the value-added content. Alternatively, the linking mechanism can include
15 an annotation associated with the animation, audio, and/or video data. More preferably, the linking mechanism is dependent upon the content the animation, audio, and/or video data.

In step 608, the animation, audio, and/or video data and the value-added content are
20 presented to the user. The value-added content can be presented separately in a device for reproducing the animation, audio and/or video data, such as a television or video monitor. Alternatively, it can be presented in or on the animation, audio and video data in a device for reproducing the animation, audio and video data. Processing terminates in step 610.

25

As described in relation to the first embodiment, the process of Fig. 6 can be implemented as an apparatus and/or a computer program product.

Fig. 7 is a flow diagram of a method of distributing advertisements with animation,
30 audio and/or video data delivered for presentation by way of broadcast or streaming over a network in accordance with a third embodiment of the invention. Processing

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commences in step 700. In step 702, animation, audio and/or video data is delivered for presentation. In step 704, an advertisement related to the animation, audio and/or video data is provided separately. Preferably, the advertisement is capable of connecting a user with a remote location via a network by user interaction with the advertisement. In step 706, one or more advertisement control links are provided for linking separate advertisements with the animation, audio and/or video data. In step 708, the advertisement is presented to a user during presentation of the animation, audio and/or video data dependent upon the advertisement control link. Optionally, the method includes a step (not shown) of vending a product or service by means of electronic commerce or contacting a call centre dependent upon the advertisement. Processing terminates in step 710.

Figs. 8A to 8E are a detailed flow diagram of a method of displaying advertisements in association with a movie or video in accordance with a fourth embodiment of the invention. The flow diagram illustrates many specific details, however, those skilled in the art will appreciate that numerous changes can be made to the process without departing from the scope and spirit of the invention. Likewise, while detailed steps of a process involving video or movies is set forth, the process can be readily adapted for application in relation to audio and/or animation data in view of the disclosure herein.

20

With reference to Fig. 8A, processing commences in step 800. In step 802, an identifier (e.g. a title) of a movie or video is read, and the sources of the movie/video and the advertisement control database are determined. In step 804, the advertisement control database is opened. In step 806, a panel in a graphical computing environment (e.g. Microsoft Windows 98) for displaying an advertisement is created, and the current list of advertisements is set to null. In step 808, a panel is also created for displaying the movie or video. The movie preferably plays in this panel as a separate thread. After step 808, three separate threads are carried out preferably substantially in parallel by the operating system. In Fig. 8A, the separate threads are denoted by connectors A, B and C corresponding to Figs. 8B, 8C, and 8D, respectively.

30

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Fig. 8B is a flow diagram of a thread for handling incoming advertisement controls and advertisements. The advertisement controls and advertisements are streamed for presentation of the advertisements to a viewer. In step 812, the media time of the movie is obtained from the media player. In step 814, a cache storing advertisement controls is updated. In step 816, the locations of new advertisements are obtained from the updated advertisement control data cache. In step 818, the advertisement cache is updated by streaming the advertisements for the current portion of the movie playing and for an additional predefined period yet to be played. In decision block 820, a check is made to determine if the advertisement update thread (Fig. 8C) or the movie playing thread has ended. If decision block 820 returns false (NO), processing continues at step 812. Otherwise, if decision block 820 returns true (YES), the thread terminates in step 822.

The process of Fig. 8B can be readily implemented for handling the use of annotations to link the advertisements and the movie. The annotations of the movie can be obtained for the currently playing portion of the movie and a few annotations read ahead for a portion(s) of the movie yet to be played. The annotations in the movie are then matched with the annotations of the advertisements in the advertisement control data cache. The locations of the advertisements are determined in this manner. The advertisements are then streamed to update the advertisement cache.

Fig. 8C is a flow diagram of the process of presenting advertisements while a movie is playing. In particular, the advertisements are updated. In step 826, the media time of the player presenting the movie is read. In step 828, using the media time, a start time and an end time of a current advertisement(s), a check is made to determine if any advertisements have to be removed. This step can be readily modified to handle the case where annotation is used to link advertisements with the movie. This involves comparing the annotation of the movie with the annotation of the advertisement. The advertisement is to be played for the duration of the matching movie annotation. Decision block 830 determines this result. If decision block 830 returns false (NO), processing continues at step 834. Otherwise, if decision block 830 returns true (YES),

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the advertisement being processed is removed from the advertisement panel created in step 806. Processing then continues in step 834.

In step 834, using the media time, advertisements are selected from the advertisement cache to be made current. In decision block 836, a check is made to determine if any advertisements should be added for presentation. If decision block 836 returns false (NO), processing continues at decision block 840. Otherwise, if decision block 836 returns (YES), processing continues at step 838. In step 838, the advertisement is added to the advertisement panel created in step 806 for presentation. Processing continues at decision block 838. In decision block 840, a check is made to determine if the movie has ended or if the user has stopped play. If decision block 840 returns false (NO), processing continues at step 826. Otherwise, if decision block 840 returns true (YES), processing continues at step 842. In step 842, the player software application is closed or terminated and the advertisement control database is closed. Processing of this thread terminates in step 844.

Fig. 8D is a flow diagram of the process of playing a movie. In step 848, user inputs including fast forward, rewind, etc., are received and responded to by the player. In decision block 850, a check is made to determine if the end of the movie has been reached or it has been user terminated. If decision block 850 returns false (NO), processing continues at step 848. Otherwise, if decision block 850 returns true (YES), the thread terminates in step 852.

Fig. 8E is a flow diagram illustrating the processing of interactive user input in relation to a playing advertisement. Processing commences in step 870. In step 874, input can be received from a user. In step 876, the thread responds to the user input and performs an appropriate action as defined in the advertisement control database for the advertisement. In decision block 878, a check is made to determine if the advertisement has been removed from the advertisement panel. If decision block 878 returns false (NO), processing continues at step 874. Otherwise, if decision block 878 returns true (YES), the thread terminates in step 880.

- 20 -

Thus, Figs. 8A-8E provide specific implementation details of one particular application of the fourth embodiment in relation to movie or video data. The process can be practiced with readily apparent changes in view of the disclosure for processing
5 animation and/or audio data. This embodiment is able to strongly link advertising with the content of animation, audio and/or video data. In particular, it enables flexible control of the flow of the advertisement and the advertisement content. Importantly, the process of Figs. 8A-8E provides the advertisement for presentation to a user without requiring any modification of the movie itself and the delivery mechanism used
10 to deliver the movie. The fourth embodiment enables customised and focused content-linking of advertising to the time-sequence data.

The foregoing embodiments of the invention disclose a method, apparatus and computer program product for linking supplementary information, actions, or both, to
15 time-sequence data dependent upon the content of the time-sequence data. The time-sequence data include animation, audio and/or video data. Only a small number of embodiments have been disclosed by way of example. However, those skilled in the art will recognise that the invention can be practiced, with modification, in the light of the information contained herein without departing from the scope and spirit of the
20 invention.

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The claims defining the invention are as follows:

1. A method of presenting supplemental information, action, or both, with time-sequence data, including:

- 5 providing time-sequence data;
separately providing supplemental information, action, or both, from said time-sequence data;
linking said supplemental information, action, or both, with said time-sequence data during playback of said time-sequence data.

10

2. The method according to claim 1, wherein said supplemental information, action, or both, is linked with said time-sequence data by a start time and a stop time.

15

3. The method according to claim 1, wherein said supplemental information, action, or both, is linked with said time-sequence data by annotation information associated with said time-sequence data.

20

4. The method according to any one of claims 1 to 3, wherein said supplemental information, action, or both, is content-linked with said time sequence data.

25

5. The method according to claim 4, wherein said supplemental information, action, or both, is linked with said time-sequence data dependent upon on-the-fly analysis of the content of said time-sequence data during playback of said time-sequence data.

6. The method according to claim 1, wherein said time-sequence data is animation, audio, and/or video data.

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7. The method according to claim 1, wherein said time-sequence data is provided by broadcast.

8. The method according to claim 1, wherein said time-sequence data is
5 provided via a network.

9. The method according to claim 1, wherein said supplemental information, action, or both, is provided remotely via a network.

10. The method according to claim 1, wherein said supplemental information, action, or both, includes a displayed prompt with which a user can interact
10 by user input.

11. The method according to claim 1, wherein said supplemental
15 information, action, or both, includes a link to a remote location.

12. The method according to claim 11, wherein said link is a universal resource locator (URL).

13. The method according to claim 1, wherein said time-sequence data and
20 said supplemental information, action, or both are linked by a link means.

14. The method according to claim 13, wherein two or more of said link means, said time-sequence data, and said supplemental information, action, or both, are
25 initially co-located at their source.

15. The method according to claim 13, wherein two or more of said link means, said time-sequence data, and said supplemental information, action, or both, are initially remotely located at one or more source locations.

30

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16. An apparatus for presenting supplemental information, action, or both, with time-sequence data, including:

means for providing time-sequence data;

5 means for separately providing supplemental information, action, or both, from said time-sequence data; and

means for linking said supplemental information, action, or both, with said time-sequence data during playback of said time-sequence data.

17. The apparatus according to claim 16, wherein said supplemental
10 information, action, or both, is linked with said time-sequence data by a start time and a stop time.

18. The apparatus according to claim 16, wherein said supplemental
information, action, or both, is linked with said time-sequence data by annotation
15 information associated with said time-sequence data.

19. The apparatus according to any one of claims 16 to 18, wherein said
supplemental information, action, or both, is content-linked with said time sequence
data.
20

20. The apparatus according to claim 19, wherein said supplemental
information, action, or both, is linked with said time-sequence data dependent upon
on-the-fly analysis of the content of said time-sequence data during playback of said
time-sequence data.
25

21. The apparatus according to claim 16, wherein said time-sequence data
is animation, audio, and/or video data.

22. The apparatus according to claim 16, wherein said time-sequence data
30 is provided by broadcast.

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23. The apparatus according to claim 16, wherein said time-sequence data is provided via a network.

24. The apparatus according to claim 16, wherein said supplemental
5 information, action, or both, is provided remotely via a network.

25. The apparatus according to claim 16, wherein said supplemental information, action, or both, includes a displayed prompt with which a user can interact by user input.
10

26. The apparatus according to claim 16, wherein said supplemental information, action, or both, includes a link to a remote location.

27. The apparatus according to claim 16, wherein said link is a universal
15 resource locator (URL).

28. The apparatus according to claim 16, wherein said time-sequence data and said supplemental information, action, or both are linked by a link means.

29. The apparatus according to claim 16, wherein two or more of said link
20 means, said time-sequence data, and said supplemental information, action, or both, are initially co-located at their source.

30. The apparatus according to claim 28, wherein two or more of said link
25 means, said time-sequence data, and said supplemental information, action, or both, are initially remotely located at one or more source locations.

31. A computer program product having a computer readable medium having a computer program recorded therein for presenting supplemental information,
30 action, or both, with time-sequence data, including:
means for providing time-sequence data;

- 25 -

means for separately providing supplemental information, action, or both,
from said time-sequence data; and

means for linking said supplemental information, action, or both, with said
time-sequence data during playback of said time-sequence data.

5

32. The computer program product according to claim 31, wherein said
supplemental information, action, or both, is linked with said time-sequence data by a
start time and a stop time.

10

33. The computer program product according to claim 31, wherein said
supplemental information, action, or both, is linked with said time-sequence data by
annotation information associated with said time-sequence data.

15

34. The computer program product according to any one of claims 31 to
33, wherein said supplemental information, action, or both, is content-linked with said
time sequence data.

20

35. The computer program product according to claim 34, wherein said
supplemental information, action, or both, is linked with said time-sequence data
dependent upon on-the-fly analysis of the content of said time-sequence data during
playback of said time-sequence data.

25

36. The computer program product according to claim 31, wherein said
time-sequence data is animation, audio, and/or video data.

37. The computer program product according to claim 31, wherein said
time-sequence data is provided by broadcast.

30

38. The computer program product according to claim 31, wherein said
time-sequence data is provided via a network.

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39. The computer program product according to claim 31, wherein said supplemental information, action, or both, is provided remotely via a network.

40. The computer program product according to claim 31, wherein said supplemental information, action, or both, includes a displayed prompt with which a user can interact by user input.

41. The computer program product according to claim 31, wherein said supplemental information, action, or both, includes a link to a remote location.

42. The computer program product according to claim 31, wherein said link is a universal resource locator (URL).

43. The computer program product according to claim 31, wherein said time-sequence data and said supplemental information, action, or both are linked by a link means.

44. The computer program product according to claim 31, wherein two or more of said link means, said time-sequence data, and said supplemental information, action, or both, are initially co-located at their source.

45. The computer program product according to claim 44, wherein two or more of said link means, said time-sequence data, and said supplemental information, action, or both, are initially remotely located at one or more source locations.

46. A method of providing value-added content related to at least one of animation, audio, and video data, while said at least one of animation, audio, and video data is being presented to a user, including the steps of:
delivering said at least one of animation, audio, and video data for presentation to said user;

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providing said value-added content being separate from said at least one of animation, audio and video data; and

providing linking means, separate from said at least one of animation, audio, and video data, for linking said value-added content with said at least one of animation, audio, and video data in a controllable and on-the-fly manner prior to presentation of said at least one of animation, audio, and video data and said value-added content.

47. The method according to claim 46, further including the step of presenting for said user said at least one of animation, audio, and video data and said value-added content.

48. The method according to claim 46 or 47, wherein said value-added content is an advertisement.

49. The method according to claim 46, wherein said linking means includes a start time and a stop time of said value-added content in relation to said at least one of said animation, audio, and video data.

50. The method according to claim 46, wherein said linking means includes an annotation associated with said at least one of said animation, audio, and video data.

51. The method according to claim 46, wherein said value-added content includes a universal resource locator (URL).

52. The method according to claim 46, wherein said value-added content includes a set of instructions for performing operations on a local apparatus or a remote apparatus linked with said local apparatus by a network.

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53. The method according to claim 47, wherein said value-added content is presented separately in a device for reproducing said at least one of animation, audio and video data.

5 54. The method according to claim 47, wherein said value-added content is presented in or on said at least one of animation, audio and video data in a device for reproducing said at least one of animation, audio and video data.

55. The method according to claim 46, wherein said linking means is
10 dependent upon the content said at least one of animation, audio, and video data.

56. An apparatus for providing value-added content related to at least one of animation, audio, and video data, while said at least one of animation, audio, and video data is being presented to a user, including:

15 means for delivering said at least one of animation, audio, and video data for presentation to said user;

means for providing said value-added content being separate from said at least one of animation, audio and video data; and

means for providing linking means, separate from said at least one of
20 animation, audio, and video data, for linking said value-added content with said at least one of animation, audio, and video data in a controllable and on-the-fly manner prior to presentation of said at least one of animation, audio, and video data and said value-added content.

25 57. The apparatus according to claim 56, further including means for presenting to said user said at least one of animation, audio, and video data and said value-added content.

58. The apparatus according to claim 56 or 57, wherein said value-added
30 content is an advertisement.

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59. The apparatus according to claim 56, wherein said linking means includes a start time and a stop time of said value-added content in relation to said at least one of said animation, audio, and video data.

5 60. The apparatus according to claim 56, wherein said linking means includes an annotation associated with said at least one of said animation, audio, and video data.

61. The apparatus according to claim 56, wherein said value-added content
10 includes a universal resource locator (URL).

62. The apparatus according to claim 57, wherein said value-added content includes a set of instructions for performing operations on a local apparatus or a remote apparatus linked with said local apparatus by a network.

15

63. The apparatus according to claim 57, wherein said value-added content is presented separately in said means for representing said at least one of animation, audio and video data.

20 64. The apparatus according to claim 57, wherein said value-added content is presented in or on said at least one of animation, audio and video data in said means for reproducing said at least one of animation, audio and video data.

65. The apparatus according to claim 56, wherein said linking means is
25 dependent upon the content said at least one of animation, audio, and video data.

66. A computer program product having a computer readable medium having a computer program recorded therein for providing value-added content related to at least one of animation, audio, and video data, while said at least one of
30 animation, audio, and video data is being presented to a user, including:

- 30 -

means for delivering said at least one of animation, audio, and video data for presentation to said user;

means for providing said value-added content being separate from said at least one of animation, audio and video data; and

5 means for providing linking means, separate from said at least one of animation, audio, and video data, for linking said value-added content with said at least one of animation, audio, and video data in a controllable and on-the-fly manner prior to presentation of said at least one of animation, audio, and video data and said value-added content.

10

67. The computer program product according to claim 66, further including means for presenting to said user said at least one of animation, audio, and video data and said value-added content.

15

68. The computer program product according to claim 66 or 67, wherein said value-added content is an advertisement.

20

69. The computer program product according to claim 66, wherein said linking means includes a start time and a stop time of said value-added content in relation to said at least one of said animation, audio, and video data

25

70. The computer program product according to claim 66, wherein said linking means includes an annotation associated with said at least one of said animation, audio, and video data.

30

71. The computer program product according to claim 66, wherein said value-added content includes a universal resource locator (URL).

72. The computer program product according to claim 66, wherein said value-added content includes a set of instructions for performing operations on a local

- 31 -

computer program product or a remote computer program product linked with said local computer program product by a network.

73. The computer program product according to claim 67, wherein said
5 value-added content is presented separately in said means for presenting said at least one of animation, audio and video data.

74. The computer program product according to claim 67, wherein said
value-added content is presented in or on said at least one of animation, audio and
10 video data in said means for reproducing said at least one of animation, audio and video data.

75. The computer program product according to claim 66, wherein said
linking means is dependent upon the content said at least one of animation, audio, and
15 video data.

76. A method of distributing advertisements with animation, audio and/or
video data, said animation, audio and/or video data being delivered for presentation by
way of broadcast or streaming over a network, said method including the steps of:
20 delivering said animation, audio and/or video data for presentation;
delivering a separate advertisement related to said animation, audio and/or
video data;
providing an advertisement control link for linking said separate advertisement
with said animation, audio and/or video data; and
25 presenting for a user said advertisement during presentation of said animation,
audio and/or video data dependent upon said advertisement control link.

77. The method according to claim 76, wherein said advertisement is
capable of connecting a user with a remote location via a network by user interaction
30 with said advertisement.

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78. The method according to claim 77, further comprising the step of vending a product or service by means of electronic commerce or contacting a call centre dependent upon said advertisement.

- 5 79. An apparatus for distributing advertisements with animation, audio and/or video data, said animation, audio and/or video data being delivered for presentation by way of broadcast or streaming over a network, said apparatus including:
- means for delivering said animation, audio and/or video data for presentation;
 - 10 means for delivering a separate advertisement related to said animation, audio and/or video data;
 - means for providing an advertisement control link for linking said separate advertisement with said animation, audio and/or video data; and
 - 15 means for presenting for a user said advertisement during presentation of said animation, audio and/or video data dependent upon said advertisement control link.

20 80. The apparatus according to claim 79, wherein said advertisement is capable of connecting a user with a remote location via a network by user interaction with said advertisement.

21 81. The apparatus according to claim 80, further comprising means for vending a product or service using electronic commerce or by contacting a call centre dependent upon said advertisement.

25 82. An computer program product for distributing advertisements with animation, audio and/or video data, said animation, audio and/or video data being delivered for presentation by way of broadcast or streaming over a network, said computer program product including:

- means for delivering said animation, audio and/or video data for presentation;
- 30 means for delivering a separate advertisement related to said animation, audio and/or video data;

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means for providing an advertisement control link for linking said separate advertisement with said animation, audio and/or video data; and

means for presenting for a user said advertisement during presentation of said animation, audio and/or video data dependent upon said advertisement control link.

5

83. The computer program product according to claim 82, wherein said advertisement is capable of connecting a user with a remote location via a network by user interaction with said advertisement.

10

84. The computer program product according to claim 83, further comprising means for vending a product or service using electronic commerce or by contacting a call centre dependent upon said advertisement.

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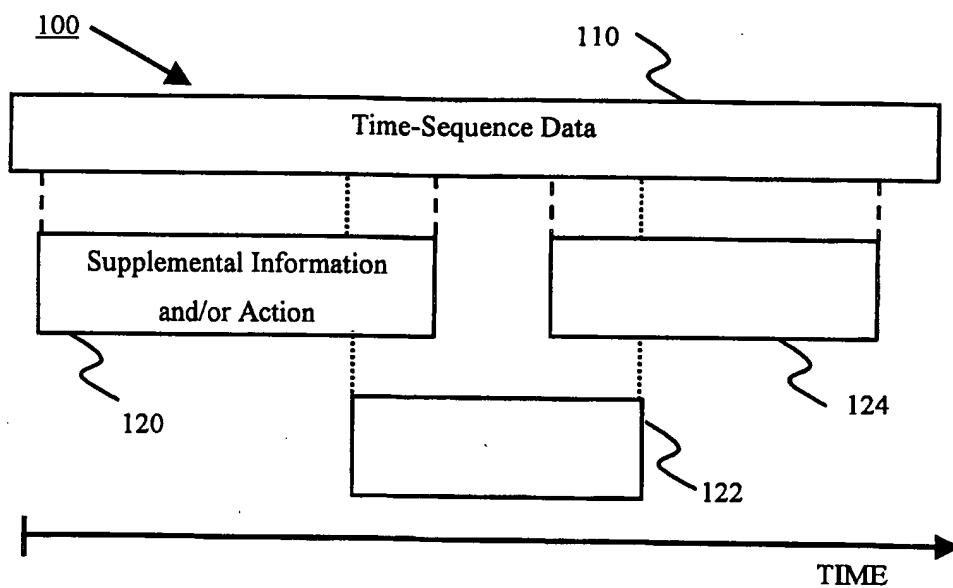


FIG. 1A

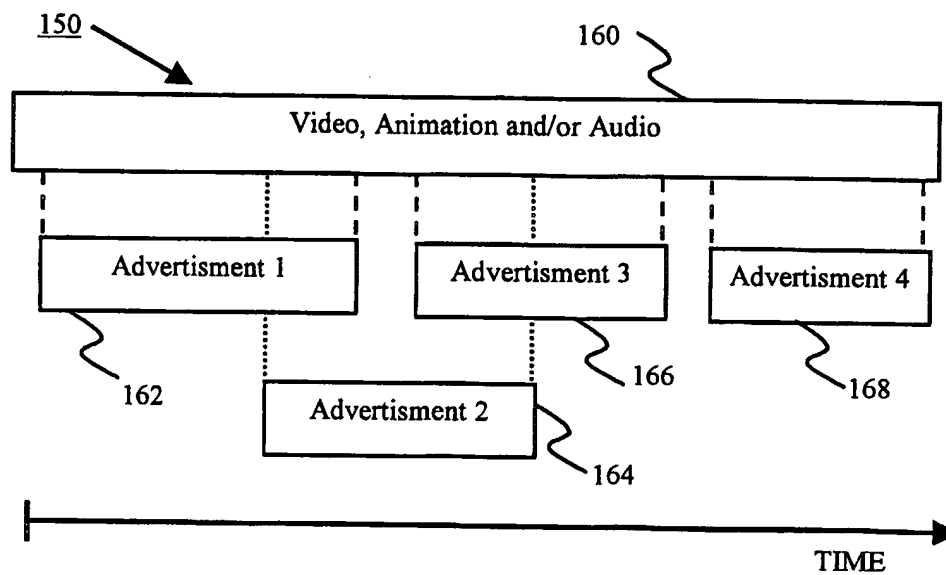


FIG. 1B

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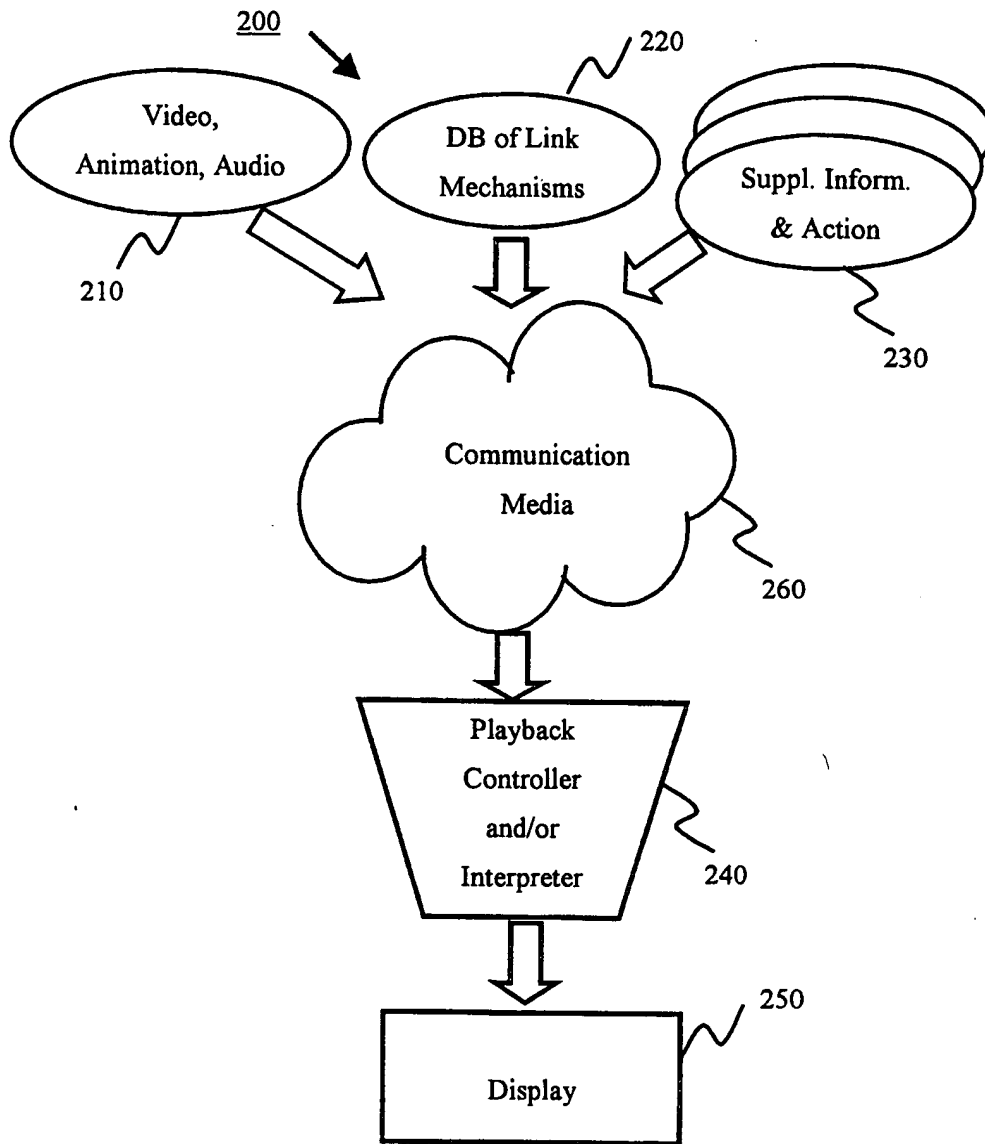


FIG. 2

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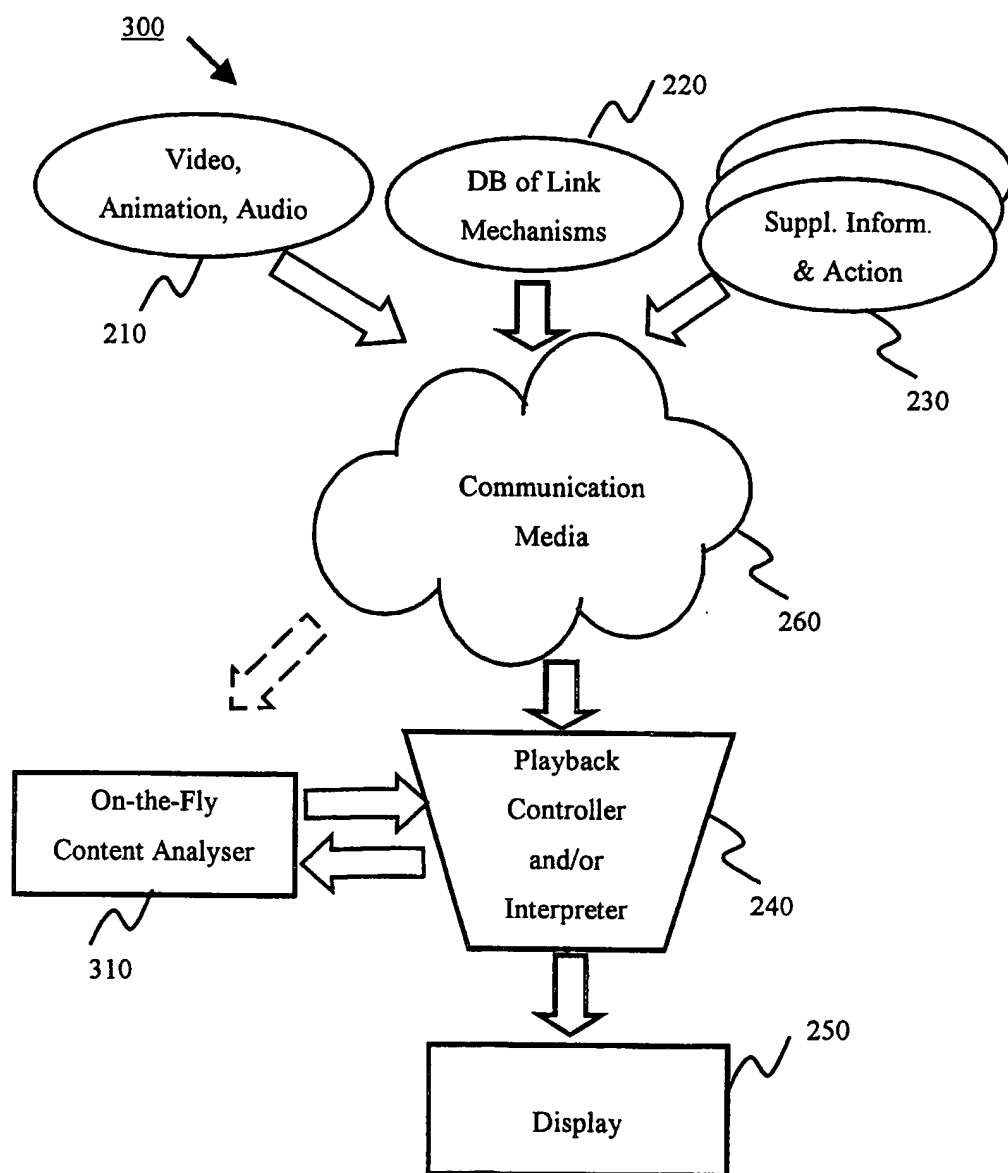


FIG. 3

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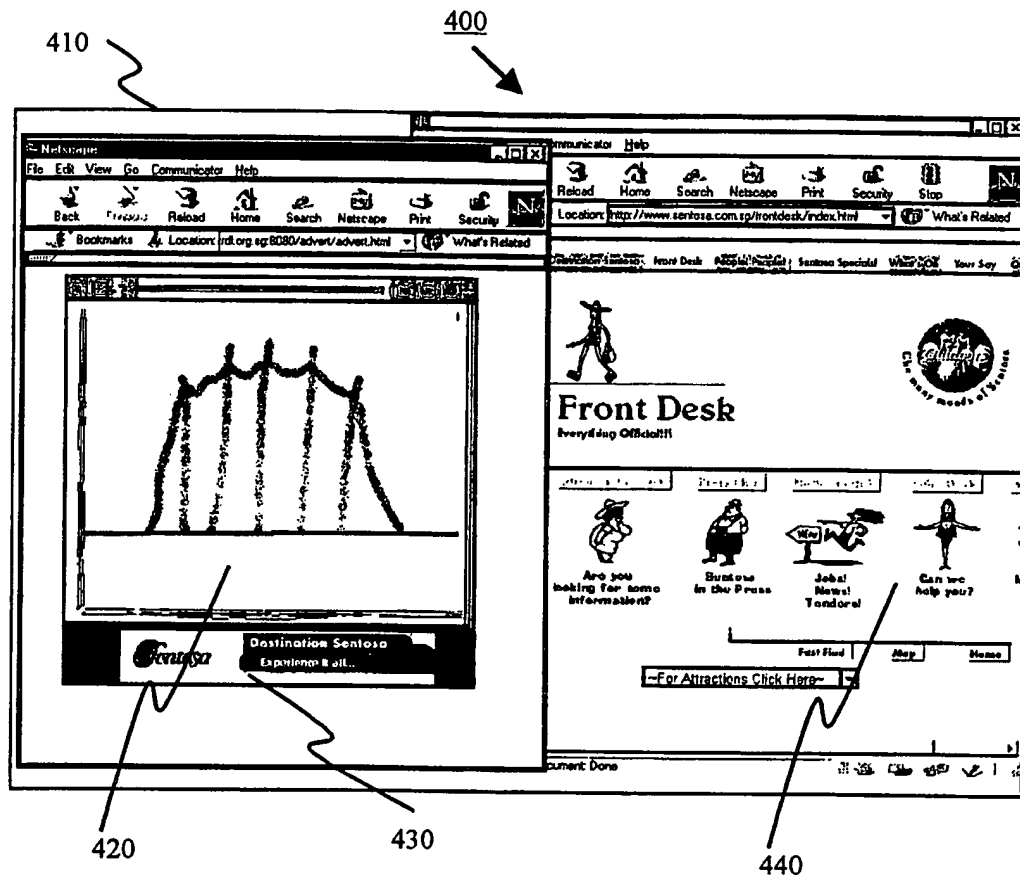


Fig. 4

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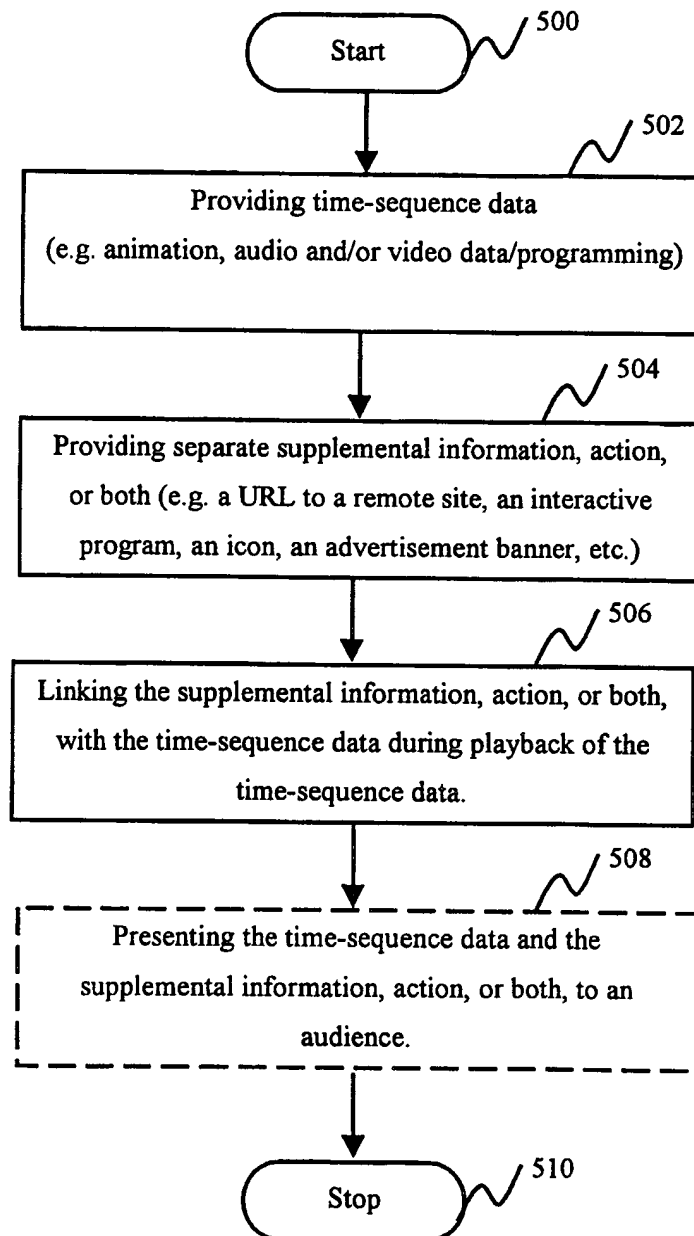


FIG. 5

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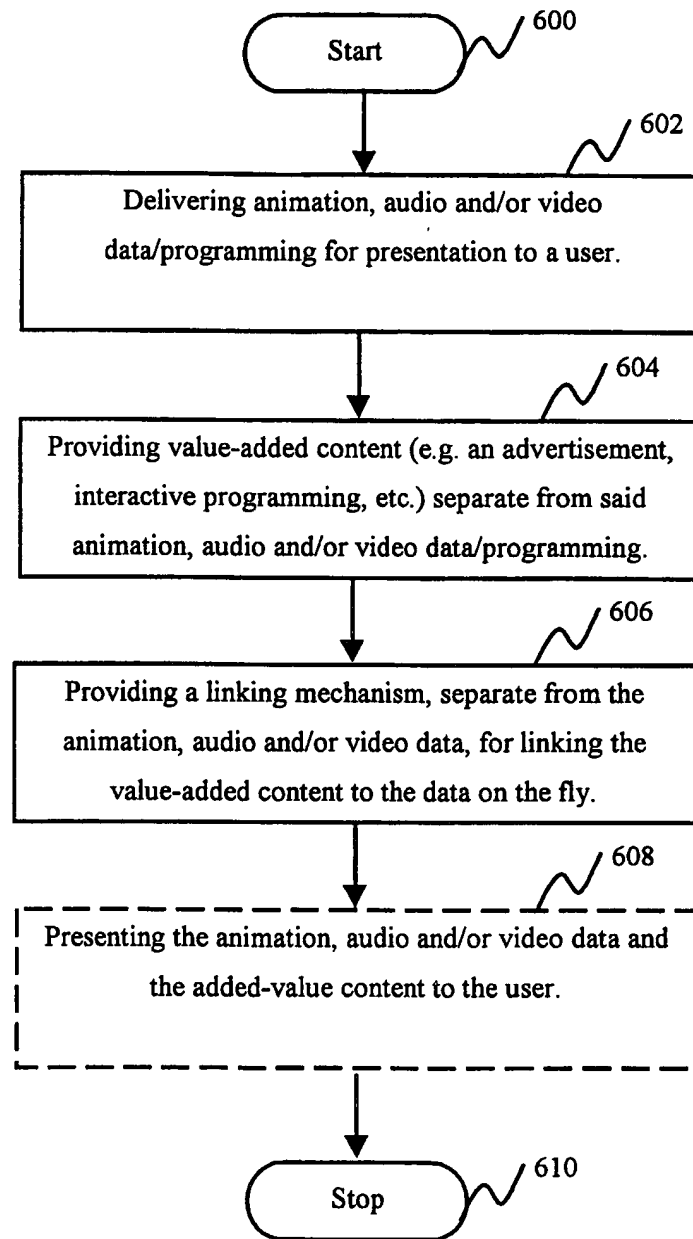


FIG. 6

- 7/12 -

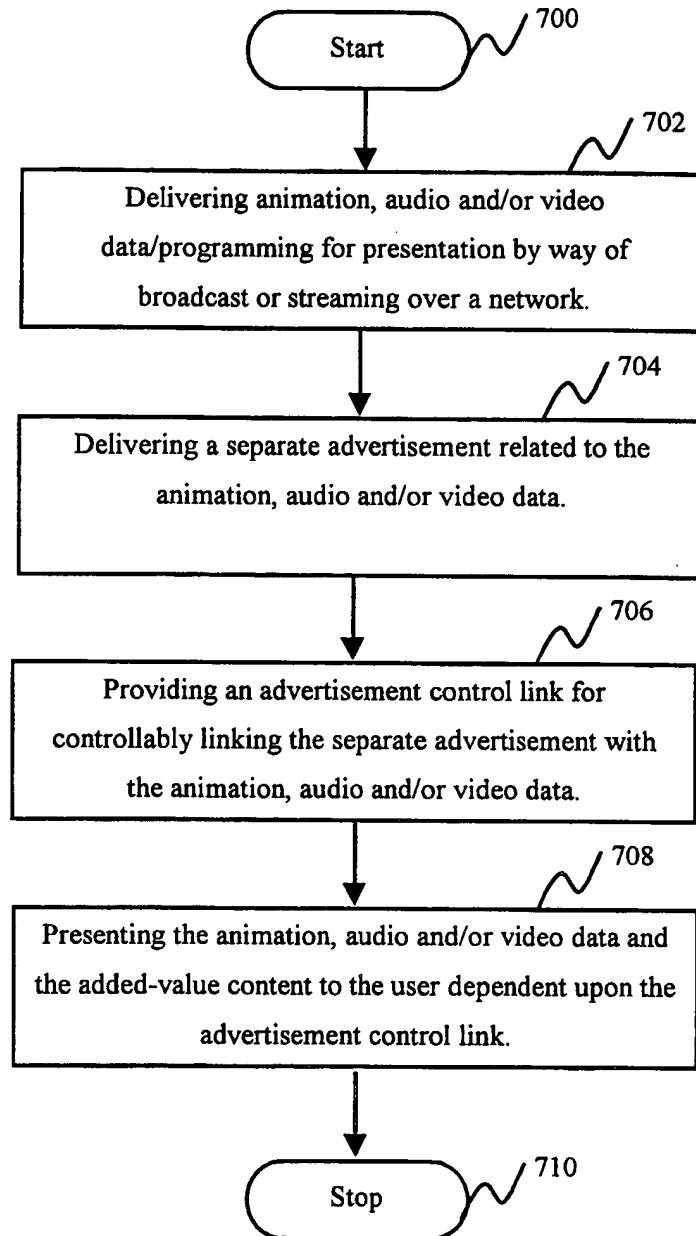


FIG. 7

- 8/12 -

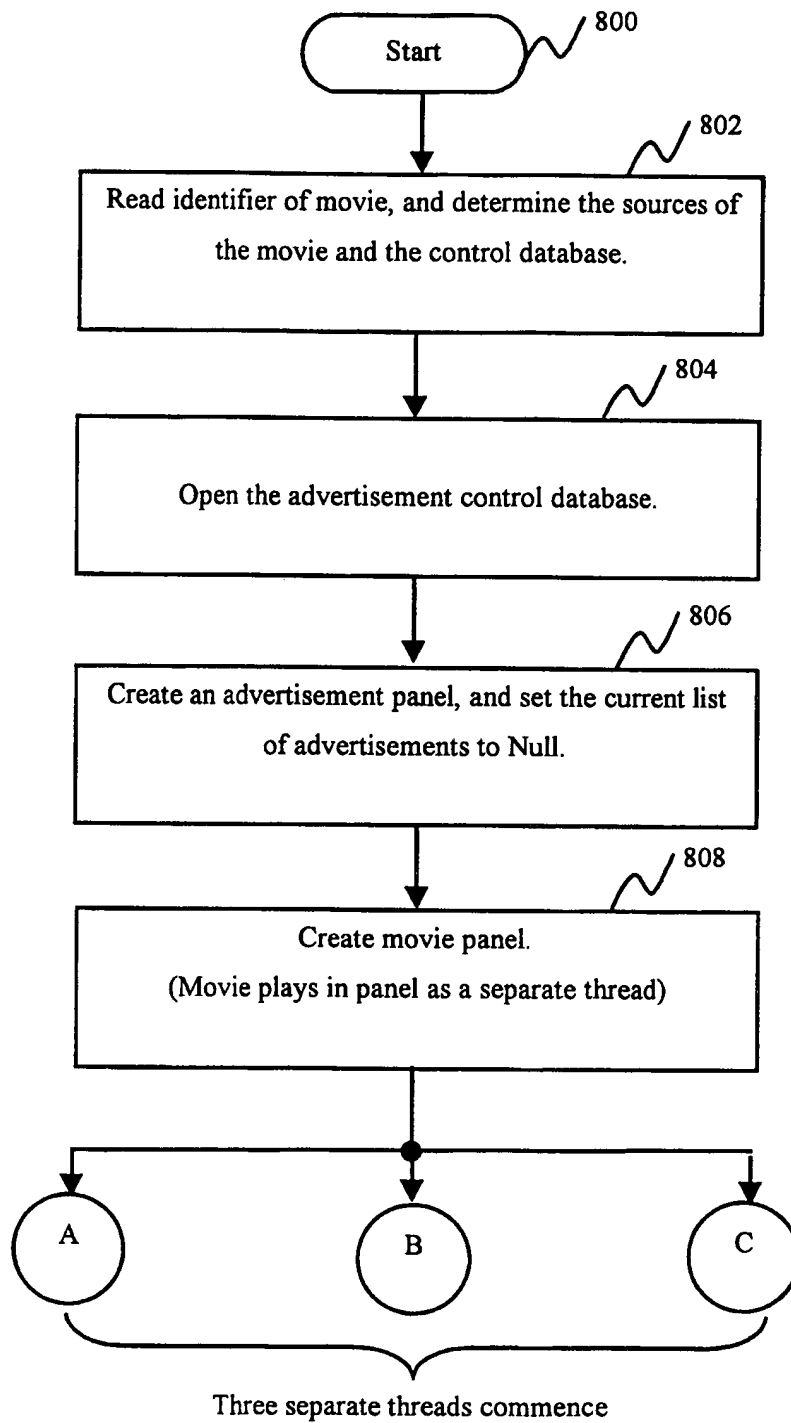


FIG. 8A

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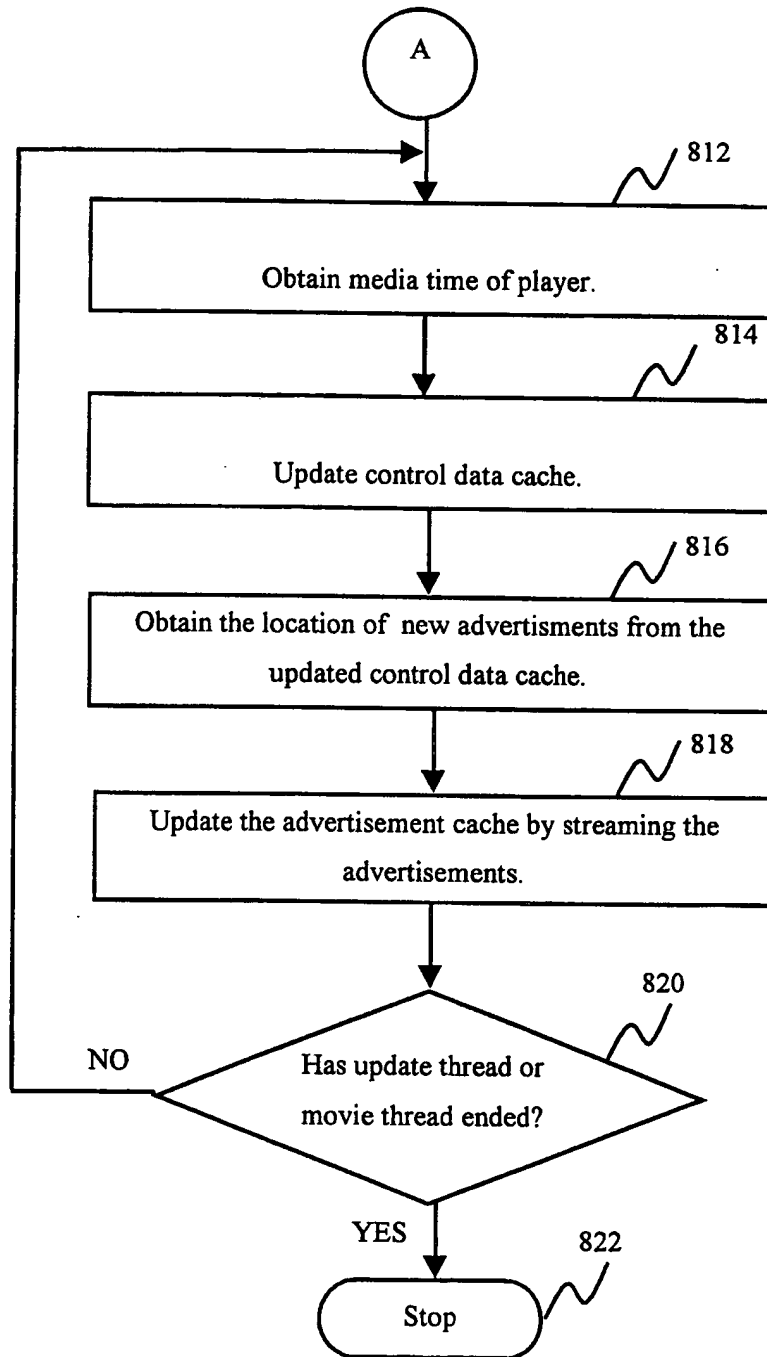


FIG. 8B

- 10/12 -

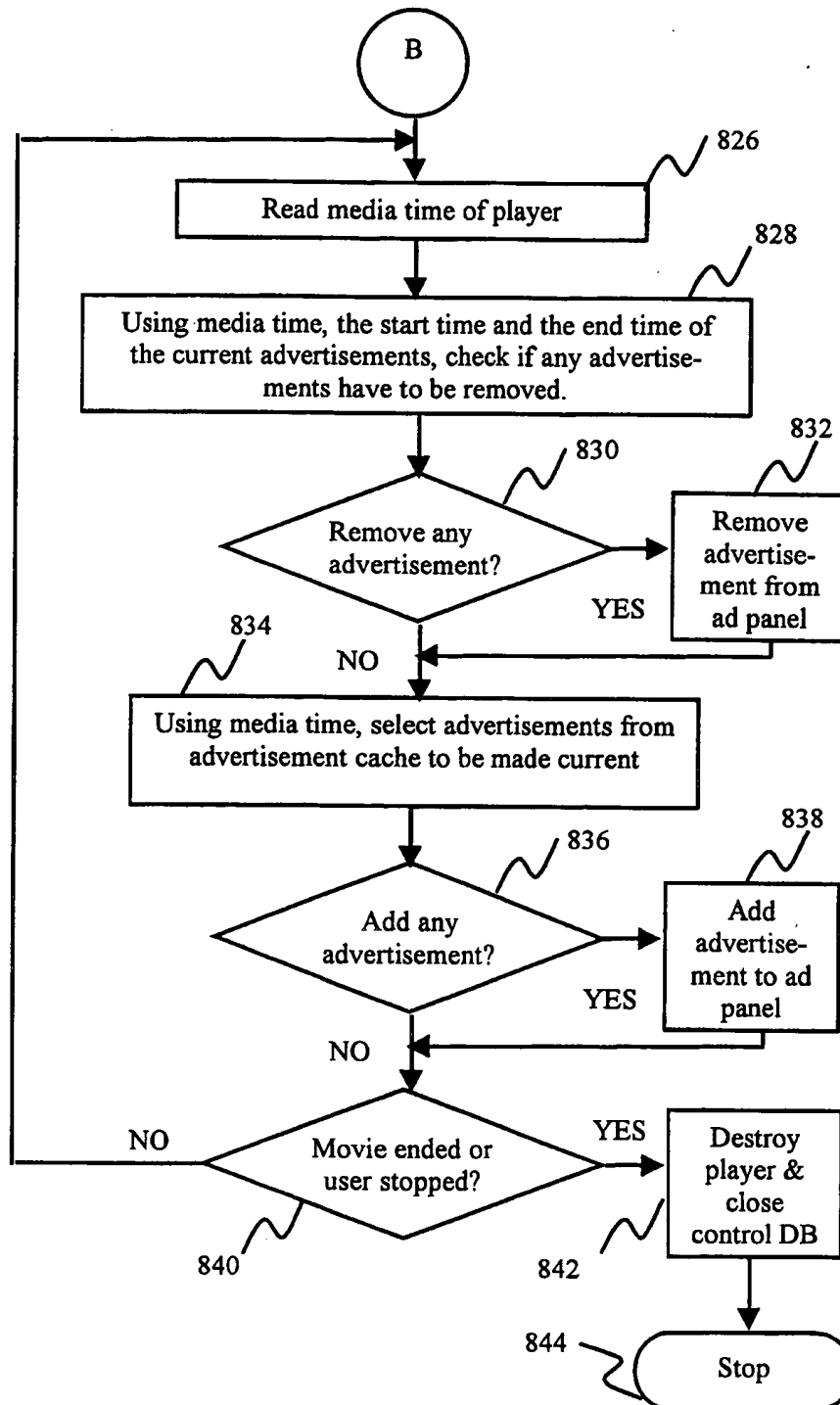


FIG. 8C

- 11/12 -

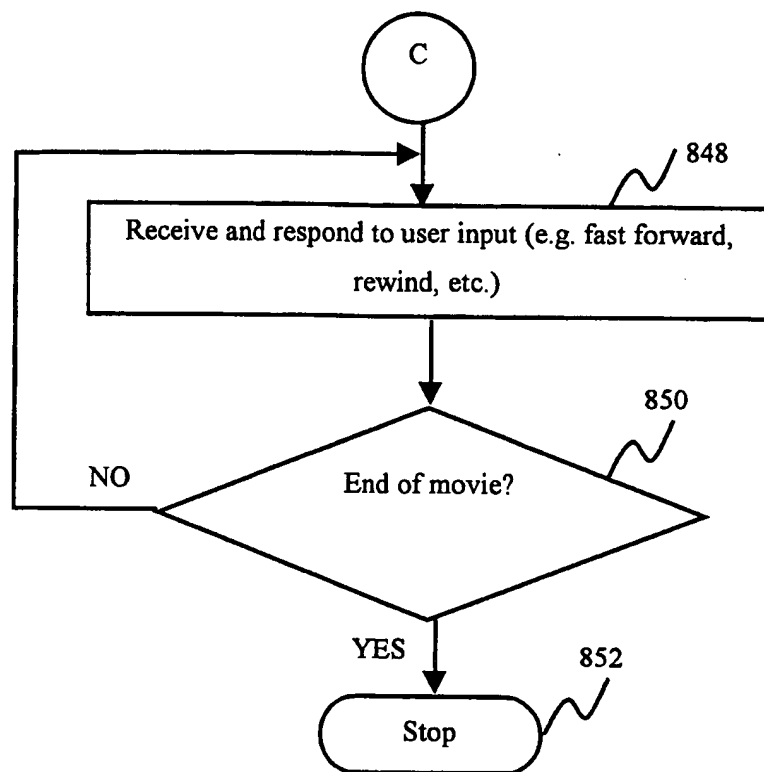


FIG. 8D

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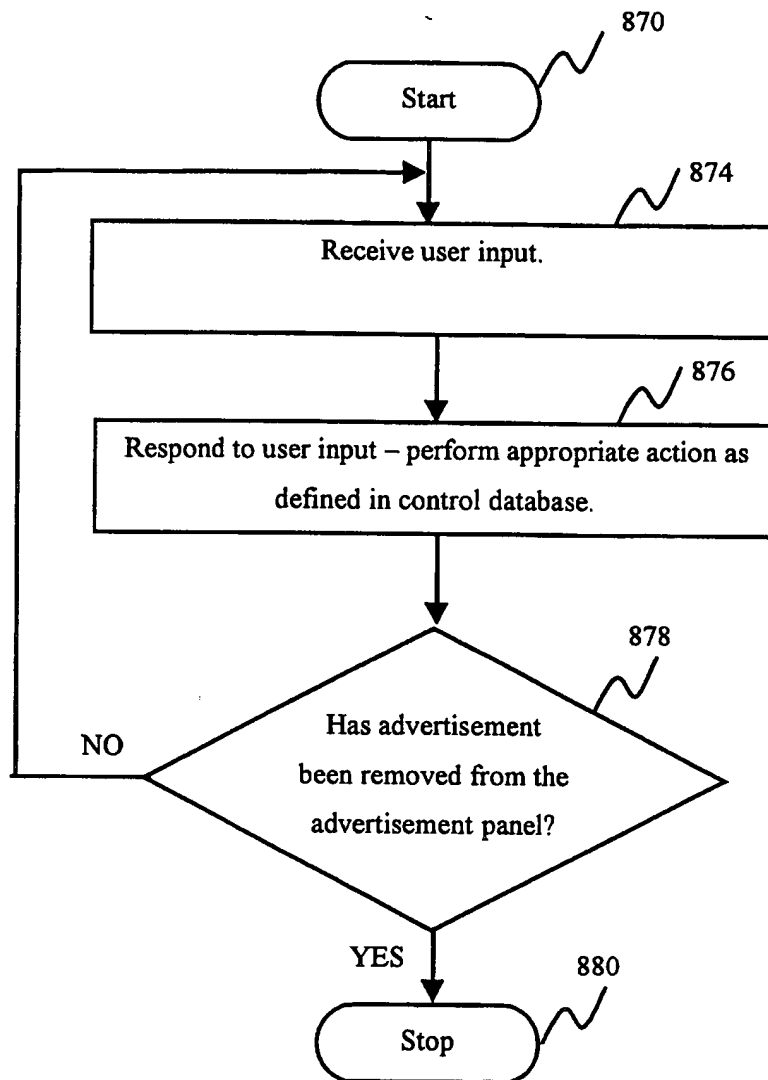


FIG. 8E

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SG 98/00096

A. CLASSIFICATION OF SUBJECT MATTER		
IPC ⁷ : G 06 F 13/00, H 04 N 7/08, H 04 N 5/50		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC ⁷ : G 06 F, H 04 N		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
EPODOC, WPI, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5778181 A (HIDARY) 07 July 1998 (07.07.98), claims 1-3,10,19; abstract.	1,2,5-7,10-13, 16,17,21,22,25, 26,31,32,36,37, 40,41,43,49,56, 59,76-84
X	US 5774664 A (HIDARY) 30 June 1998 (30.06.98), claims 1-3.	1,2,5-7,10-13, 16,17,21,22,25, 26,31,32,36,37, 40,41,43,49,56, 59,76-84
X	EP 0742669 A1 (MATSUSHITA) 13 November 1996 (13.11.96), claims 1-4,16-20.	1,2,6,16,17,21, 31,32,37,66,67, 69,79
A	US 5696905 A (REIMER) 09 December 1997 (09.12.97), claims 1-16. ----	
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SG98/00096

Patent document cited in search report			Publication date	Patent family member(s)			Publication date
US	A	5778181	07-07-1998	AU	A1	20705/97	22-09-1997
				EP	A1	885525	23-12-1998
				EP	A4	885525	23-12-1998
				EP	A2	982943	01-03-2000
				WO	A1	9733434	12-09-1997
				US	A	5774664	30-06-1998
				US	A	6018768	25-01-2000
US	A	5774664	30-06-1998	AU	A1	20705/97	22-09-1997
				EP	A1	885525	23-12-1998
				EP	A4	885525	23-12-1998
				EP	A2	982943	01-03-2000
				WO	A1	9733434	12-09-1997
				US	A	5778181	07-07-1998
				US	A	6018768	25-01-2000
EP	A1	742669	13-11-1996	DE	C0	69604614	18-11-1999
EP	B1	742669	13-10-1999	JP	A2	8307840	22-11-1996
				US	A	5659366	19-08-1997
US	A	5696905	09-12-1997	JP	A2	8287107	01-11-1996
				US	A	5715400	03-02-1998